

LIST OF SHELLS COLLECTED BY VERNON BAILEY IN HERON
AND EAGLE LAKES, MINNESOTA, WITH NOTES.

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The species listed below have been received at various times from the United States Department of Agriculture. They form a part of the collection of the United States National Museum, and were collected by Mr. Vernon Bailey, an assistant in the Division of Biological Exploration, in charge of Dr. C. Hart Merriam.

Heron Lake is in southwestern Minnesota, in Jackson County, near the Iowa line. The material from this place was, to quote Mr. Bailey, "scraped up on the beach," in 1887.

Eagle Lake is in Sherburne County. This county is nearer the center of the State, being rather south and east of the center. The collections from both places are small, so far as the number of species is considered, but not without interest, as certain forms, which are commented on at some length, indicate peculiar environmental conditions. These conditions can only be surmised from the material itself, in the place of personal investigation of the lakes and their waters as well as the immediate region in which they are situated. The testimony of the numerous examples of *Planorbis trivolvis* from Heron Lake and *Limnaea emarginata* from Eagle Lake points to considerable fluctuation in the volume of the water one season compared with another, and in the more northerly Eagle Lake to the influence of extreme cold, or alternations of temperature conditions as related to volume of water in some seasons or years, as well as possible alkalinity or some chemical fluctuation due to diminished volume of water at times, or, briefly, to fluctuations in the quantity and temperature of the waters and the chemical quality or proportions in the same.

The Eagle Lake shells were collected in 1891.

LIMNÆA PALUSTRIS Müller.

Heron Lake; a few examples.

LIMNÆA CAPERATA Say.

Heron Lake; infrequent.

LIMNÆA DESIDIOSA Say.

Eagle Lake; two living examples (Cat. No. 123895, U.S.N.M.).

LIMNÆA EMARGINATA Say.

Eagle Lake; abundant. Of the total number of shells from this lake, nine-tenths belong to this species and its varieties, numbering, perfect and imperfect being counted, probably four hundred examples.

A. *Normal form* (Cat. No. 123887, U.S.N.M.); smooth; spire moderately elevated; rather solid and ventricose; columellar fold or twist, rather strong.

B. *Spire short* (Cat. No. 123888, U.S.N.M.); rather thin and ventricose, ranging from young to adult.

C. *Body whorl shouldered above* (Cat. No. 123889, U.S.N.M.); spire short to elevated; surface smooth to malleated; solid.

D. *Deeply sutured; spire rather high* (Cat. No. 123890, U.S.N.M.); surface smooth; some individuals marked by strong incremental lines; others inconspicuously lirate; young to adult.

E. *Malleated; obtusely lirate* (Cat. No. 123891, U.S.N.M.); in some examples partially obtusely lirate; others showing sharply developed growth lines; spire moderate; shell rather solid; aperture effuse; numerous examples.

F. *Patulous; aperture more or less reflected* (Cat. No. 123892, U.S.N.M.); surface smooth or malleated; obtusely lirate in some instances; spire moderate; several examples.

G. *Distorted, bulging* (Cat. No. 123893, U.S.N.M.); shells globose or elongated; solid; smooth or malleated; suture deep; aperture in some examples effuse; numerous specimens.

H. *Immature* (Cat. No. 123894, U.S.N.M.); this number and tube includes juvenile examples of many of the foregoing, and other varietal facies.

PLANORBIS TRIVOLVIS Say.

Heron Lake; abundant (Cat. No. 104462, U.S.N.M.). A dwarfed and apparently arrested form of this widely distributed species was obtained in great numbers by Mr. Bailey. The largest individual measured, maximum, only 12.50 mm., while the average of numerous examples is not over 9 mm., maximum. There are two varietal forms, which point to hybridization, suggesting *campanulatus* in one direction and *bicarinatus* in the other. Among 143 perfect individuals, 6 exhibit the abrupt varicose character of aperture so conspicuous in *campanulatus*, and there are many examples that lean toward *bicarinatus*, with a pretty sharp angle on the upper and an obtuse keel on the under side of the whorls. These are registered in the United States National Museum, as follows:

P. trivolvis var. A (Cat. No. 104463, U.S.N.M.).

P. trivolvis var. B (Cat. No. 104464, U.S.N.M.).

PLANORBIS BICARINATUS Say.

Heron Lake (Cat. No. 104465, U.S.N.M.); Eagle Lake (Cat. No. 123897, U.S.N.M.). The 4 specimens from the first-named place are distinctly characteristic; from the last numerous examples were obtained.

PLANORBIS PARVUS Say.

Heron Lake (Cat. No. 104461, U.S.N.M.); Eagle Lake (Cat. No. 123899, U.S.N.M.). From each of the lakes, a few individuals were found in the general mass of material; apparently less common than the larger species.

PLANORBIS CAMPANULATUS Say.

Eagle Lake (Cat. No. 123898, U.S.N.M.); two examples.

PHYSA HETEROSTROPHA Say.

Heron Lake; Eagle Lake (Cat. No. 123896, U.S.N.M.). From the former several examples; from the latter two rather undersized specimens.

PHYSA GYRINA Say.

Heron Lake; a few specimens.

BYTHINELLA OBTUSA Lea.

Heron Lake (Cat. No. 104459, U.S.N.M.); Eagle Lake (Cat. No. 123902, U.S.N.M.). Many examples from each of the lakes, but apparently less frequent than the following:

AMNICOLA CINCINNATIENSIS Anthony.

Heron Lake (Cat. No. 104458, U.S.N.M.); Eagle Lake (Cat. No. 123901, U.S.N.M.). Abundant in Heron Lake, frequently of large size; also common in Eagle Lake.

VALVATA TRICARINATA Say.

Heron Lake (Cat. No. 104460, U.S.N.M.); Eagle Lake (Cat. No. 123900, U.S.N.M.). Exceedingly common and of large size in Heron Lake; the median keel sometimes obsolete. Eight examples from Eagle Lake.

SUCCINEA OVALIS Gould.

Near Heron Lake (Cat. No. 104466, U.S.N.M.). A single example of this terrestrial form was detected near the margin of the lake.

SPHÆRIUM STRIATINUM Lamarck.

Heron Lake (Cat. No. 104467, U.S.N.M.); not uncommon.

SPHÆRIUM SOLIDULUM Prime.

Heron Lake; many dead valves.

PISIDIUM COMPRESSUM Prime.

Heron Lake; a single dead valve.

PISIDIUM VARIABLE Prime.

Eagle Lake (Cat. No. 123903, U.S.N.M.); numerous odd valves.

It is presumable that these lakes contain many species not mentioned above. It should be borne in mind that no attempt was made by Mr. Bailey to make an exhaustive collection of the molluscan life in these bodies of water; he simply collected such material as came readily to his hand without interfering with his special work.